

Amendments to the Drawings:

Formal drawings are submitted herewith under Separate Letter to the Draftsperson. For the convenience of the Examiner, a copy of the formal drawings are also attached with this amendment.

Attachment: Replacement Figures

REMARKS

Status of the Claims:

The Office Action dated December 29, 2006 has been received and reviewed by the applicant. Claims 1-14 are in the application. Claims 1-14 stand rejected.

Claims 1, 5, and 10 were rejected as being indefinite. Applicant has followed the Examiner's suggestion and believes that these claims are now clear and definite. In addition, claims 2, 6, and 11 have been deleted and the dependency of claims 3, 7, and 12 have been changed.

Claim Rejection - 35 USC § 103

Claims 1-14 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Rossi et al. (US Patent 6,974,973) in view of Borg (European Patent Application Publication 1,117,250 A2).

Applicant's invention will now be briefly reviewed with respect to amended claim 1 which is believed to be representative of the invention.

An image sensor is provided having rows and columns of pixels. The top portion of the image sensor has pixels for capturing the image and the bottom portion includes rows of dark reference pixels. A problem with image sensors that has long been recognized by the art is dark current. Dark current must be compensated for. By having this specific arrangement of the image sensor, the dark reference pixels are shielded from light and simultaneously applied to individual sample and hold circuits. An operational amplifier sequentially produces a substantially average dark reference signal for each row of dark reference pixels.

In the depicted embodiment shown in Fig. 1, there are three rows of dark reference pixels. The invention produces an average signal for each of the rows of dark reference pixels. This arrangement allows each dark row signal to be done substantially simultaneously. In the past, a row of dark reference pixels is read out sequentially, applied to a sample and hold circuit again sequentially, and then sub-sequently processed to produce an average.

US Patent No. 6,974,973 to Rossi et al. discloses an image sensor with dark pixels surrounding all sides of the imager. This arrangement would require at least at times, reading out both image sensor pixels and dark reference pixels. This process uses current and not voltage. Sample and hold circuits are

not used for reading out dark current signals but only imager pixels. Current mirrors are used in the read out of dark reference pixels.

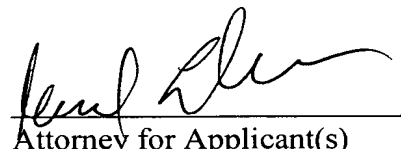
European Patent Application Publication 1,117,250 A2 to Borg discloses circuitry for dark current. It is true that dark reference pixels in Borg are substantially shielded from light. The dark reference pixels in each rows are shorted together as a means of combining their signals. No sample and hold circuit is used. There is no operational amplifier used to provide an average signal.

Applicant fails to see how these two references can easily combine, since sample and hold circuits are not used in either of them. Current mirrors are used in Rossi et al. and a buffer amplifier (not an operational amplifier) is used in Borg. There is no motivation in either of these references for the subject matter now set forth in amended claims 1 and 5.

It is believed that these changes now make the claims clear and definite and, if there were any problems with these changes, Applicants' attorney would appreciate a telephone call.

In view of the foregoing, it is believed that none of the references, taken singly or in combination, disclose the claimed invention. Accordingly, this application is believed to be in condition for allowance, the notice of which is respectfully requested.

Respectfully submitted,



Attorney for Applicant(s)
Registration No. 22,363

Raymond L. Owens/mjl
Rochester, NY 14650
Telephone: 585-477-4653
Facsimile: 585-477-4646

If the Examiner is unable to reach the Applicant(s) Attorney at the telephone number provided, the Examiner is requested to communicate with Eastman Kodak Company Patent Operations at (585) 477-4656.

Enc. Letter to the Official Draftperson
Drawing Replacement Pages